CLAIMS:

1. Symbol detection apparatus for detecting the symbol values of a one-dimensional channel data stream recorded along one-dimensional contiguous tracks on a record carrier, wherein the symbols of adjacent tracks have a varying phase relation, comprising:

- a phase detection means (31) for detecting the phase relation of the symbols of at least two adjacent tracks,
- a processing means (30) for determining HF reference levels at the symbol positions of the symbols of said at least two adjacent tracks by recalculating an ideal two-dimensional target HF impulse response ($g_{k,2D}$) of the symbols of said at least two adjacent tracks, said ideal two-dimensional target HF impulse response ($g_{k,2D}$) representing an HF impulse response assuming no phase difference between the symbols of said at least two adjacent tracks, based on the detected phase relation, and
- a 2D symbol detection means (6) for symbol detection of the symbols of at least one of said at least two adjacent tracks using said HF reference levels ($REF_{k,i}$) and HF signal values ($HF_{k,i}$) read-out from said record carrier.

2. Symbol detection apparatus as claimed in claim 1,
further comprising a first resampling means (32) for resampling asynchronous input symbols ($HF_{k,i}$) read-out from said record carrier to synchronous output symbols ($y_{k,i}$) and wherein said processing means (30) comprises a second resampling means for recalculating said ideal two-dimensional target HF impulse response ($g_{k,2D}$) by a resampling.

3. Symbol detection apparatus as claimed in claim 2,
wherein said second resampling means (30) is adapted for resampling the ideal two-dimensional target HF impulse response ($g_{k,2D}$) onto lattice points of a physical lattice, the lattice points of said physical lattice representing the symbol positions of said at least two adjacent tracks, and wherein said first resampling means (32) is adapted for resampling the asynchronous input symbols ($HF_{k,i}$) from said at least two adjacent tracks onto the lattice points of said physical lattice based on the output of said phase detection means (31)

4. Symbol detection apparatus as claimed in claim 2,

wherein said second resampling means (30) is adapted for resampling the ideal two-dimensional target HF impulse response ($g_{k,2D}$) onto lattice points of a state lattice, the lattice points of said state lattice representing positions having a fixed phase relation at said at least two adjacent tracks, and wherein said first resampling means is adapted for resampling the asynchronous input symbols ($HF_{k,i}$) from said at least two adjacent tracks onto to lattice points of said state lattice based on the output of said phase detection means (31) for one particular reference track of said at least two adjacent tracks.

5. Symbol detection apparatus as claimed in claim 1,

further comprising updating means (33) for updating said ideal two-dimensional target HF impulse response ($g_{k,2D}$) by use of preliminary symbol values detected by said 2D symbol detection means (6).

6. Symbol detection apparatus as claimed in claim 2,

wherein said first resampling means (32) is adapted for separate recovery of the timing on said at least two adjacent tracks, in particular using one or more sampling rate converters, and for detecting the phase relation of said tracks from the detected timing.

7. Symbol detection apparatus as claimed in claim 1,

wherein said processing means comprises a low-pass filter (H_1) for filtering a difference signal representing the difference between the phase of said at least two adjacent tracks.

8. Symbol detection apparatus as claimed in claim 1,

further comprising a cross-talk cancellation means (10, 11, 12) for cancellation of cross-talk introduced from neighbouring tracks of said at least two adjacent tracks into said at least two adjacent tracks.

9. Symbol detection apparatus as claimed in claim 1,

wherein said 2D symbol detection means (6) comprises a Viterbi detector, in particular a trellis-based stripe-wise Viterbi detector for iterative stripe-by stripe symbol detection, a stripe comprising said at least two tracks.

10. Symbol detection apparatus as claimed in claim 1, wherein said phase detection means (31) is adapted for detecting the phase relation of the symbols of three adjacent tracks, and wherein said processing means (30) is adapted for determining HF reference levels at the symbol positions of the symbols of said three adjacent tracks.

11. Symbol detection apparatus as claimed in claim 10, wherein said 2D symbol detection means (6) is adapted for symbol detection of the symbols of said three adjacent tracks.

12. Symbol detection method for detecting the symbol values of a one-dimensional channel data stream recorded along one-dimensional contiguous tracks on a record carrier, wherein the symbols of adjacent tracks have a varying phase relation, comprising the steps of:

- detecting the phase relation of the symbols of at least two adjacent tracks,
- determining HF reference levels ($REF_{k,i}$) at the symbol positions of the symbols of said at least two adjacent tracks by recalculating an ideal two-dimensional target HF impulse response ($g_{k,2D}$) of the symbols of said at least two adjacent tracks, said ideal two-dimensional target HF impulse response ($g_{k,2D}$) representing an HF impulse response assuming no phase difference between the symbols of said at least two adjacent tracks, based on the detected phase relation, and
- symbol detection of the symbols of at least one of said at least two adjacent tracks using said HF reference levels ($REF_{k,i}$) and HF signal values ($HF_{k,i}$) read-out from said record carrier by use of a 2D symbol detection means (6).

13. Reproduction apparatus for reproduction of a user data stream from a one-dimensional channel data stream recorded on a record carrier, comprising a symbol detection apparatus as claimed in claim 1 for detecting the symbol values of said channel data stream.

14. Reproduction method for reproduction of a user data stream from a one-dimensional channel data stream recorded on a record carrier, comprising a symbol detection method as claimed in claim 12 for detecting the symbol values of said channel data stream.

15. Computer program comprising program code means for causing a computer to carry out the steps of the method as claimed in claims 12 or 14 when said computer program is run on a computer.Two-dimensional symbol detector for one-dimensional symbol detection